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However perfect the definitions or severe the penalties for violations of the law may be, still, unless the means for enforcing its provisions are furnished, no good would come of it. The establishing and maintaining the force necessary for the due supervision and control, under a national law, of such adulterated foods should be suitably provided for, and the rules and regulations for their guidance should be vested in some responsible bureau officer, with the approval of the Secretary of the Department.

This force should be divided into two classes: (1) The inspectors, who would be assigned to certain districts, and should visit all manufactories of food products, including slaughter-houses and dairies, and the places of all dealers where articles of food intended for consumption are sold, displayed, or stored, procuring, by purchase or otherwise, samples for inspection or analysis. They should have the necessary police authority to detain, seize, or destroy adulterated articles of food wherever found, as now vested in most municipal sanitary police officers. (2) The analysts, under the control of a chief, would be required to make the necessary chemical and physical examinations of the samples of food collected by the inspectors, or submitted, under suitable regulations, by other parties. The duly verified certificate of an analyst, stating that the examination of the sample submitted shows it to be adulterated within the meaning of the act, shall be received as evidence of the fact in any proceedings taken against any person for violation of the law. The defendant, however, shall have the right to require the attendance of the analyst for the purpose of cross-examination.

Standards of strength, quality, or purity of different foods shall be fixed from time to time and prescribed by the Secretary of the Department for the guidance of the analysts.

Where samples of food products are received from the public at large they should be accompanied with an affidavit stating the facts in the case, and a small fee for the analysis of the same should be paid in advance.

The inspection of meat, fish, vegetables, fruit, and especially milk, should be done daily in any large city, and properly belongs to the health department of such city.

If such a law should take the form of a revenue measure many provisions of existing laws in regard to special taxes, stamps, brands, returns, notices, etc., could be made to apply, and very little increase in the force of the Internal Revenue Bureau would be needed.

If the manufacturers of adulterated goods paid special taxes at the rate of one dollar per month, wholesale dealers fifty cents per month, and retail dealers twenty cents for the same time, and a tax of one mill per pound were collected on every article of food adulterated within the meaning of the act, the revenue thus derived would not much more than cover the expense of enforcing such a law.

EDGAR RICHARDS.

NOTES AND NEWS.

AN ingenious contrivance has been recently adopted at the Hippodrome in Paris, with a view to producing scenic effects in the central oval space, without the spectators opposite being seen at the same time. *Nature* describes the contrivance as an elliptical screen of fine steel netting, which is let down in comparative darkness, so as to be about twelve feet in front of the benches. This is painted on the inner side with a representation of the Place du Vieux Marché at Rouen (the piece being "Jeanne d'Arc"), and,

as it is strongly illuminated, at a given moment, from the centre, the light outside being low, a spectator at any point has an excellent view of the scene, while seeing nothing of the crowd beyond.

—James W. Queen, who founded the well-known house of James W. Queen & Co. of Philadelphia, died on July 12. He had been retired from business many years, so that his death will have no effect on the Philadelphia firm.

—In his recent thesis on the influence of the sea-shore on leaves M. Pierre Lesage shows by conclusive evidence, says *Nature*, that a marine habitat leads to a thickening of the leaves. The palisade-cells are more numerous and larger than in the leaves of the same plants grown inland. Apparently the sea-salt is the cause of this alteration, as plants cultivated in artificially salted soil yield thicker leaves. The observations of M. Lesage bear on some ninety species of plants which are in their natural state found near the sea (in Brittany) as well as inland.

—Professor Thomas F. Hunt, Assistant Agriculturist of the Illinois Experiment Station, reports a comparative feeding test between corn fodder and corn silage, the results of which are slightly in favor of the dry cured fodder. While the results of the experiments are somewhat contradictory, those which bear evidence of the greatest thoroughness agree in indicating that there is practically no difference between the feeding values of a given quantity of corn cured as ensilage and an equivalent quantity cured as dry fodder, provided equally good husbandry has been practised in both cases. Whether corn may be cured and preserved more economically by the one process or the other depends largely upon local circumstances and seasonal peculiarities.

—Commenting on an article on the influence of the moon on weather, by Dr. G. Meyer, *Nature* says, that, although such investigations have hitherto given a negative result, the author thought that with the materials furnished by synoptic charts he might eliminate local influences, and he gives tables extending over a number of years, which seem to show the influence of the moon in lowering the height of the barometer in the months of September to January, at the time of full moon, and in raising it during the first quarter. The Deutsche Seewarte, which communicates the article, points out that a similar result has been independently arrived at by Captain Seemann, one of the assistants of the institution. The same effect or any other is not perceptible in other months.

—The following facts, quoted by *Nature* from its French namesake *La Nature*, relate to exceptional seasons in past centuries. They were collected by M. Villard, of Valence, for France especially, and for Europe generally. In 1282 the winter was so mild that corn-flowers were sold in Paris in February. New wine was also drunk at Liège on Aug. 24. In 1408 the winter was so severe that nearly all the Paris bridges were carried away by the ice. Ink froze in the pen, although a fire was in the room. [A similar fact is quoted by Dove as occurring at Sebastopol on Dec. 13, 1855.] All the sea between Norway and Denmark was frozen. The summers of 1473 and 1474 were disastrously hot. In the winter of 1544-45 wine was frozen in barrels all over France. It was cut with hatchets and sold by the pound. In 1572-73 nearly all the rivers were frozen. The Rhone was traversed by carriages at various places. In 1585 the winter was very mild; corn was in ear at Easter, but the third week in May was extremely cold.

—The Belgian Legation at Mexico has recently reported to the Belgian Government on the subject of "guimbobo," known also as "angu," which is found in the State of Vera Cruz, a plant which should be included in the category of all the varieties of Mexican textiles. An American specialist has been appointed to examine and report upon the fibre-producing qualities of this plant. This gentleman has discovered that the guimbobo produces not only a fibre of very superior quality, but that it can be easily and cheaply cultivated; moreover, the fruit of the plant constitutes a nutritious food. According to the *Journal of the Society of Arts*, it appears from experiments that have already been made that the guimbobo differs essentially from the ramie, cotton, and hemp, as in the guimbobo the covering of the plant surrounds the fibre, and is not mixed up and interlaced with it;

this constitutes a decided economy, added to great facility, in extraction and utilization. The structure of the plant permits of the operations of separating and removing the bark being performed by machinery, while in the other fibrous plants these operations must be effected by hand, a system at the same time very costly, and only possible in countries where there is a large number of hands available and cheap. It is stated by the American specialist that he could construct a machine, costing no more than the ordinary machines used for cotton, and which could be used in the same manner. By this machine the fibre could be extracted and sold by the pound in the same way as cotton. Persons cultivating this plant would benefit in addition by the sale of the fruit, which is much esteemed in the temperate and tropical countries of the South, where the guimbobo grows luxuriantly, and almost without any care. The fibre of the guimbobo has a lustre similar to that of silk, and is undoubtedly finer and stronger, with a creamy color between white and straw color.

—A new gun, the invention of M. Giffard, the well-known French inventor, is attracting considerable attention among military men in Europe. As described in the *London Times*, the propulsive agent in this novel weapon is carbonic acid gas, compressed to a liquid condition, and capable of giving a pressure of five hundred pounds per square inch. The liquefied gas is contained in a metallic tubular reservoir about nine inches long, which is fixed under and in a line with the barrel of the gun, and which is conveniently grasped by the left hand in firing. Although containing an immense store of power, there does not appear to be any danger in a weapon thus equipped. In the first place, the reservoir is made of Siemens-Martin steel of the highest quality, so that a burst is considered hardly possible; and, in the second, should a flaw in the metal lead to a fracture, the gas would simply escape much in the same way that it does on the opening of a bottle of soda water. Then, the quality of the metal used for the gas receiver is such that it will stand rough usage without liability to fracture. It may be, and, indeed, has been, knocked greatly out of shape when full of gas without any prejudicial result arising, the gas having been afterwards used for discharging projectiles from the gun. The bullet is dropped into a small aperture at the rear end of the barrel, and by moving a small lever it is deposited in the breech chamber of the gun. The hammer is then placed at full cock and the trigger pulled. By the fall of the hammer a pin is struck which opens a valve at the rear of the liquefied gas reservoir, and permits the instantaneous escape of a sufficient volume of gas for one discharge. The bullet is thus ejected with a force proportionate to the impelling power of the charge, which can be increased or decreased at pleasure by a simple screw arrangement. In other words, the propelling power is completely under control, although, of course, this in practice is not left to the arbitrary will of the ordinary user, but will be fixed and definite, according to the character of the gun in which it is employed. The discharge of the gun is unaccompanied by any report, nor is there the least recoil or kick. On pulling the trigger there is a slight hiss or puff, followed by the noise of the impact of the bullet upon the iron target. The reservoir is very light, and when charged with liquefied carbonic acid gas, is capable, according to the size and calibre of the gun, of discharging from one hundred to five hundred consecutive shots at a stated cost of less than one penny. It is stated that there is no fear of any part of the gun or its mechanism becoming oxidized by the gas, and it is hardly necessary to add that there is neither smoke nor smell from the propellant. There is also no deterioration of the liquefied gas from storage or keeping. With regard to the rifle itself, with the exception of the tubular reservoir carried under the barrel, there is no material difference in appearance between the Giffard gun and an ordinary weapon of similar character.

—The success which has attended the use of arsenical sprays in combating the curculio upon the cherry and plum has led to its trial upon peach trees. London purple appears to have been most generally used in these trials, because this material has been strongly recommended during the last few years as preferable to Paris green. The advantages which London purple possesses over Paris green are its cheapness, and the fineness and lightness of the

material, allowing it to remain longer in suspension in water. But the use of London purple upon the peach has often resulted in great injury to the foliage, and sometimes to the young shoots. The injuries in the Michigan peach orchards last year led Professor Cook, of the Michigan Agricultural Experiment Station, to experiment upon the influence of the arsenites upon foliage. He found that peach foliage is especially susceptible to injury, that London purple is more injurious to foliage than is Paris green, and that this is doubtless owing to the soluble arsenic which is quite abundant in London purple and almost absent in Paris green. The colored liquid left after the complete settling of the London purple was destructive to peach foliage. It appeared that greater injury occurred when the spraying was performed shortly before a rain, and that spraying soon after the foliage puts out is less harmful than when it is delayed a few days, or a few weeks. As a general result of the trials upon the peach, it was concluded that Paris green alone should be used, and that not stronger than one pound to three hundred gallons of water. Experiments in the same direction were performed at the Agricultural Experiment Station at Cornell University last year and this year, and the experiences of the two seasons coincide, so far as the experiments are comparable. The trials at Cornell, as given in the *July Bulletin*, show that peach foliage is very susceptible to arsenical poisons, and that London purple is much more injurious than Paris green. The young leaves are much less liable to injury than the full grown leaves. This is supposed to be due entirely to the waxy covering which is so abundant upon recent leaves and shoots. Late in the season, when the young and waxy growth is slight, nearly all the leaves will be killed by a mixture which would have had scarcely any effect when the tree is just pushing into growth in spring. Injury early in the season is less apparent, also, for the reason that growth of new leaves is so rapid that defoliation is obscured. In fact, the casual observer would not have noticed that the trees which shed their leaves in the earlier experiments had sustained the slightest injury, new leaves forming faster than injured leaves fell. Injury upon the leaf is first apparent in small and definite reddish-brown spots, which are visible upon both surfaces. The centre of the spot soon assumes a lighter color, and the tissue becomes dead and translucent. The edges of the leaf become discolored in like manner, and show a tendency to curl. A close observation discloses the fact that the discolorations take just the shape of the drops or streaks of liquid which lay upon the leaf. These leaves are at once distinguished from any which may suffer from fungous troubles by the absence of raised, puffed, or ragged borders about the spots, and by the presence of the scorched margins. Shoots are injured in the same manner as the leaves. Small bright red spots appear, and blotches mark the course of the liquid as it collected and ran down the stems. The whole shoot soon becomes abnormally red, as if its growth were arrested. Sometimes these shoots die outright, but they oftener survive. When the spraying is very copious, so that the liquid washes the foliage, half or more of the leaf may die outright without becoming much spotted. In such cases the injury is quickly apparent. The liquid runs down the stems freely, and they may suffer sooner than the leaves. In some of the trials, the death of the shoots caused the wilting of the foliage, and the leaves hung loosely for some days. Microscopic examination shows that the cell walls in the dead spots retain their shape, but the protoplasm is dry and shrivelled. The peach leaf has a very delicate structure, the epidermis being remarkably narrow, with thin-walled cells. This delicacy of structure appears to account for the peculiar susceptibility of the peach leaf to injury: the poison quickly permeates the tissue. Leaves injured by London purple were found, upon analysis, after thorough washing, to contain arsenic in the texture of the leaf, while analyses of leaves injured by Paris green showed no arsenic in the texture of the leaf. The poison in the latter case had acted from the surface of the leaf. It is apparent that London purple is the more injurious because of its soluble arsenic. The arsenic in London purple is in the form of a normal arsenite of calcium, which substance comprises about 72 per cent of the whole compound, and over 50 per cent of it, or nearly 40 per cent of the London purple, is quickly soluble in water.